

Installation kits for pressure-limiting valve type MV..

Product documentation



Operating pressure p_{\max} :

700 bar

Flow rate Q_{\max} :

160 l/min



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1 Overview of installation kits for pressure-limiting valve type MV..

Pressure-limiting valves and sequence valves are types of pressure valves. Pressure-limiting valves safeguard the system against excessive system pressure or limit the operating pressure. Sequence valves generate a constant pressure difference between the inlet and outlet flow.

Pressure-limiting valves type MV.. can be installed in self-made device bodies or manifolds. Installation kits are available for this purpose, consisting of the valve seat + valve ball, spring etc. as individual parts.

The functional principle corresponds to pressure-limiting valves according to [D 7000/1](#) in the damped or undamped version.

Features and advantages

- Operating pressures up to 700 bar
- Various adjustment options
- Numerous configurations

Intended applications

- General hydraulic systems
- Test benches
- Hydraulic tools



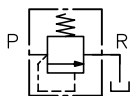
Installation kit for pressure-limiting valve type MV..

i INFORMATION

The pressure-limiting valves type MV.., SV.., DMV.. are not suitable for safeguarding pressure equipment pursuant to the Pressure Equipment Directive 2014/68/EU. The versions according to [D 7000 TUV](#), [D 7710 TUV](#) are available for this.

2 Available versions

Circuit symbol



Ordering example

MVA 6	A			
MVD 5	B	R	X	

2.1 "Basic type and size"

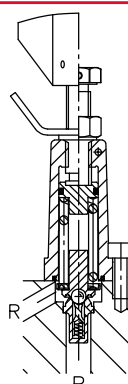
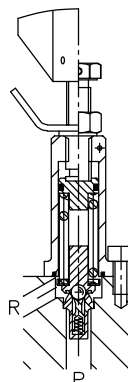
2.2 "Pressure range and flow rate"

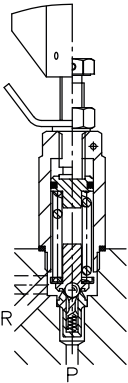
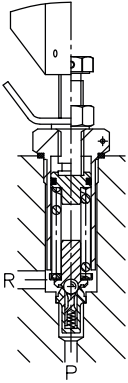
2.3 "Adjustment"

2.4 "Damping"

2.1 Basic type and size

Use with peened valve seat

Type	Size	Available pressure ranges Chapter 2.2	Available adjustments Chapter 2.3	Pressure p_{max} (bar)	View
MVF	4	A, B, C, E, F	without coding, R	P: 700 R: 20	
	5				
	6				
MVB	4	A, B, C, E, F	without coding, R, V	P: 700 R: 300	
	5				
	6	B, C, E	without coding, R	P: 400 R: 200	
8					

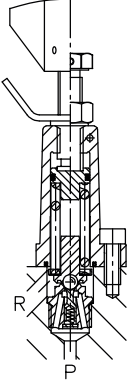
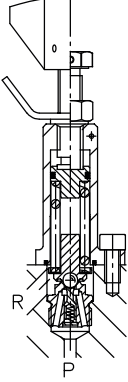
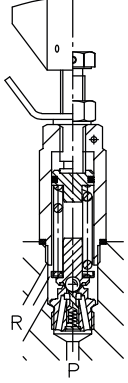
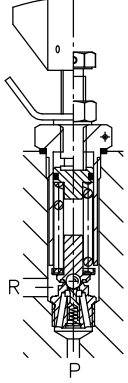
Type	Size	Available pressure ranges Chapter 2.2	Available adjustments Chapter 2.3	Pressure p_{max} (bar)	View	
MVH	4	A, B, C, E, F	without coding, R	P: 700 R: 350		
	5					
	6					
	8					B, C, E
MVJ *	6	B, C, E, F	without coding, R	P: 500 R: 50		
MVZ	4	A, B, C, E, F	without coding, R	P: 700 R: 350		
	5					
	6					

* Special version for PSL. Similar to MVH but with different flow rate range. Please request if required.

! NOTICE

To perform the assembly work, special tools for peening the valve seat are required. The assembly process is much more complex than versions with a screwed valve seat. Please take this into account when making your selection.

Installation kit with screwed-in valve seat

Type	Size	Available pressure ranges Chapter 2.2	Available adjustments Chapter 2.3	Pressure p_{max} (bar)	View
MVD	4	A, B, C, E, F	without coding, R	P: 700 R: 20	
	5				
	6				
MVA	4	A, B, C, E, F	without coding, R, V	P: 700 R: 300	
	5			P: 700 R: 200	
	6				
MVK	4	A, B, C, E, F	without coding, R	P: 700 R: 350	
	5				
	6				
MVU	4	A, B, C, E, F	without coding, R	P: 700 R: 350	
	5				
	6				

2.2 Pressure range and flow rate



Coding	Pressure p_{\max} (bar)	Flow rate Q_{\max} (l/min)			
		Size			
		4	5	6	8
A	140 - 700	12	20	40	--
B	100 - 500 (400 *)	20	40	75	160
C	60 - 315				
E	30 - 160				
F	5 - 80				

* for size 8

i INFORMATION

Lowest achievable pressure depends on the inherent flow resistance (with relieved spring) and the flow rate.

2.3 Adjustment

Coding	Description	Circuit symbol
without coding	Fixed, tool adjustable	
R	Manually adjustable (Wing bolt + wing nut)	
V	Turning knob (self-locking)	

2.4 Damping

Coding	Description
without coding	damped (series)
X	undamped

3 Parameters

3.1 General data

Design	Directly controlled pressure valve, in ball seated design
Material	<ul style="list-style-type: none"> ▪ Spring dome: MVF, MVD: zinc die casting ▪ Other types: steel
Surface protection	Steel parts and spheroidal casting, electrogalvanised, spring dome made from zinc die casting, untreated
Attachment	Depending on the type, attached using cylinder screws or screw-in mounting. The valve seat is caulked in place through plastic deformation or screwed in, depending on the type.
Installation position	any
Flow direction	P → R (Q_{max} see Chapter 2.2, "Pressure range and flow rate")
Hydraulic fluid	Hydraulic fluid, according to DIN 51 524 Parts 1 to 3; ISO VG 10 to 68 according to DIN ISO 3448 Viscosity range: 4 - 1500 mm ² /s Optimal operating range: approx. 10 - 500 mm ² /s Also suitable for biologically degradable hydraulic fluids type HEPG (polyalkylene glycol) and HEES (synthetic ester) at operating temperatures up to approx. +70°C.
Cleanliness level	ISO 4406 <hr/> 21/18/15...19/17/13
Temperatures	Environment: approx. -40 to +80 °C, hydraulic fluid: -25 to +80 °C, pay attention to the viscosity range. Start temperature: down to -40 °C is permissible (take account of the start viscosities!), as long as the steady-state temperature is at least 20 K higher during subsequent operation. Biologically degradable hydraulic fluids: note manufacturer specifications. With consideration for the seal compatibility, not above +70°C.

3.2 Weight

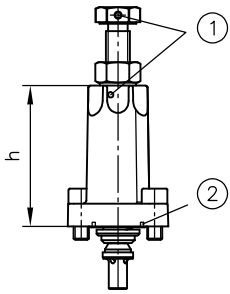
Type	Size			
	4	5	6	8
MVF	= 120 g	= 150 g	= 230 g	--
MVB	= 130 g	= 180 g	= 270 g	= 700 g
MVH	= 120 g	= 190 g	= 250 g	= 700 g
MVJ	--	--	= 250 g	--
MVZ	= 90 g	= 150 g	= 210 g	--
MVD	= 130 g	= 160 g	= 250 g	--
MVA	= 140 g	= 190 g	= 290 g	--
MVK	= 130 g	= 200 g	= 270 g	--
MVU	= 100 g	= 160 g	= 230 g	--

4 Dimensions

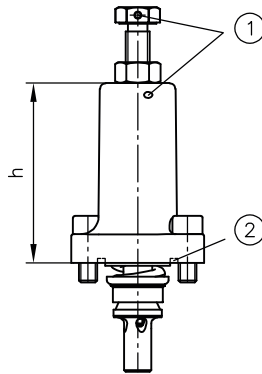
All dimensions in mm, subject to change.

4.1 Valves with peened seat

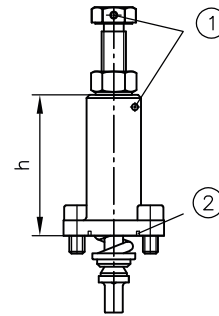
MVF 4, MVF 5



MVF 6

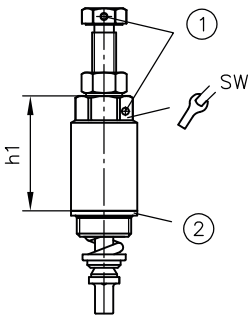


MVB 4, MVB 5, MVB 6, MVB 8



- 1 Sealing option
- 2 O-ring NBR 90 Sh

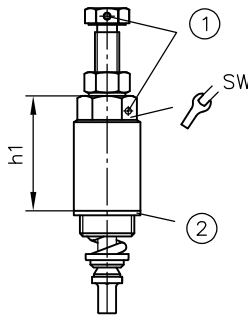
MVH 4



SW = Width across flats

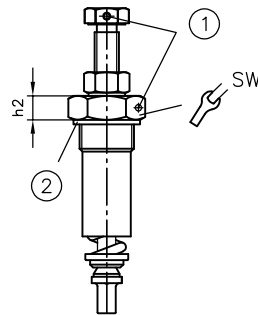
- 1 Sealing option
- 2 Sealing ring DIN 7603-St
O-ring 15.6x1.78 NBR 90 Sh

MVH 5, MVH 6, MVH 8, MVJ 6



- 1 Sealing option
- 2 Sealing ring
DIN 7603-St (size 6)
DIN 7603-Cu (size 5 and 8)

MVZ 4, MVZ 5, MVZ 6

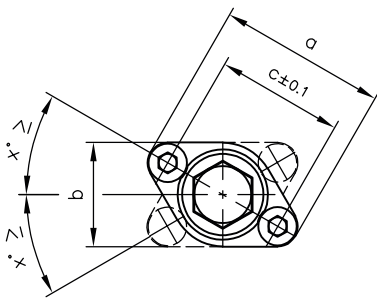


- 1 Sealing option
- 2 Sealing ring
DIN 7603-St (size 4 and 6)
DIN 7603-Cu (size 5)

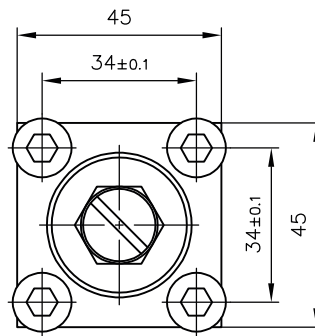
Size	h	h1	h2	SW	Tightening torque in steel (Nm)			
					Fastening screws for flange housing		Screw-in spring housing	
					MVF	MVB	MVH, MVZ	MVJ 6
4	46.5	38	8	17/22 *	5 to 5.5	5.5 to 6	80	--
5	49	42.5	10.5	27	5 to 5.5	5.5 to 6	100	--
6	59.5	52.5	8.5	30	9 to 9.5	9.5 to 10	160	100
8	83	74	--	41	--	39	300	--

* in the case of type MVZ 4

Size 4, 5, 6



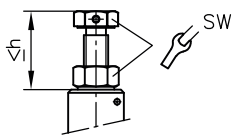
Size 8



Size	a	b	c	x°
4	37	23	28	30°
5	41	28	32	35°
6	49	30	38	35°

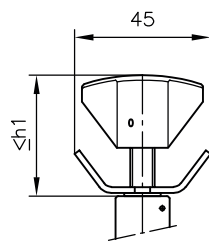
Adjustment

without coding
fixed

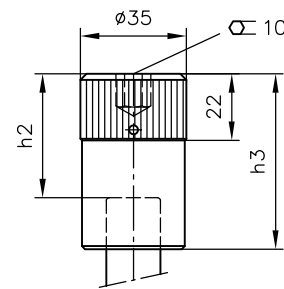


SW = Width across flats

Coding R
Manually adjustable



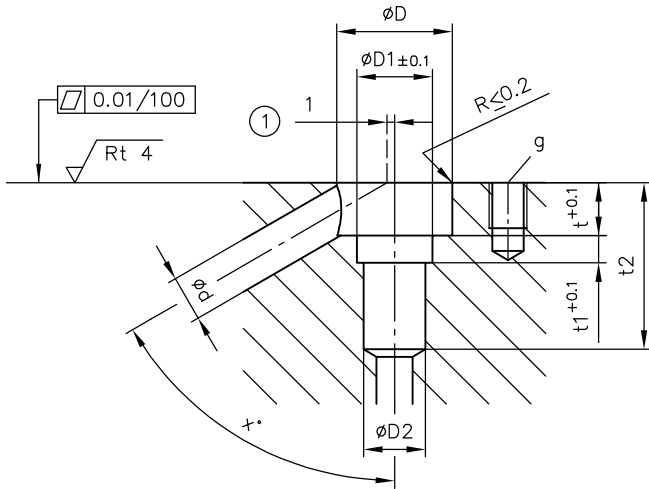
Coding V
Turning knob (self-locking)



Size	h	h1	h2	h3	SW
4	26	40	41	58	13
5	31	42	41	58	13
6	31	44	47	64	13
8	37	59	--	--	17

Mounting hole

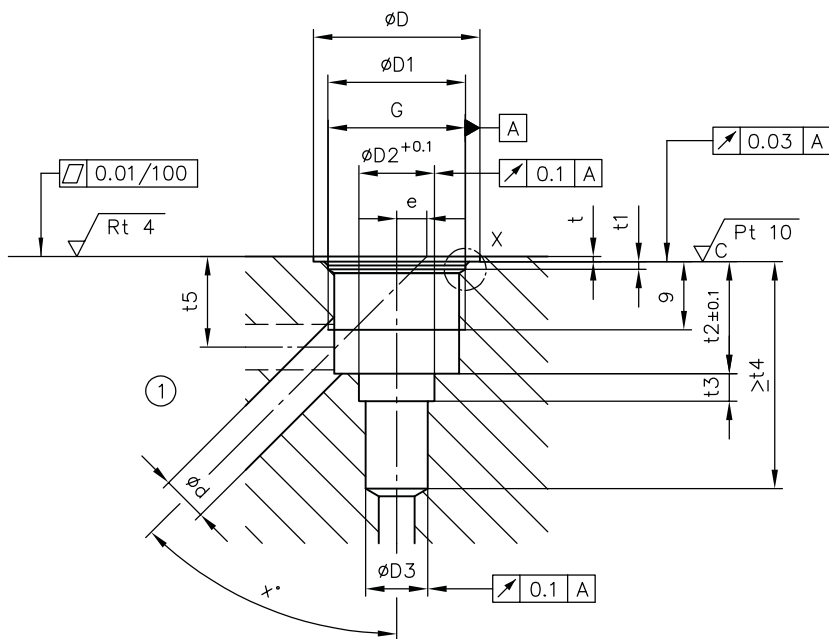
MVF, MVB



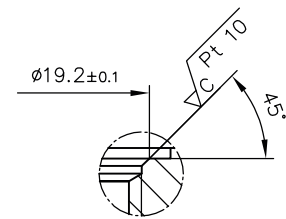
1 Size 4

Size	$\varnothing D$	$\varnothing D1$	$\varnothing D2$	$\varnothing d$	t	t1	t2	g	x°
4	15.3	10	8.2	6	7	3.6	22	M5, 6 deep	60°
5	19	12	10.4	9	10	3.5	30	M5, 7 deep	60°
6	22	16	13	12	14	4	38	M6, 7 deep	55°
8	29	20	17	16	17	7.5	43	M8, 9 deep	35°

MVH 4

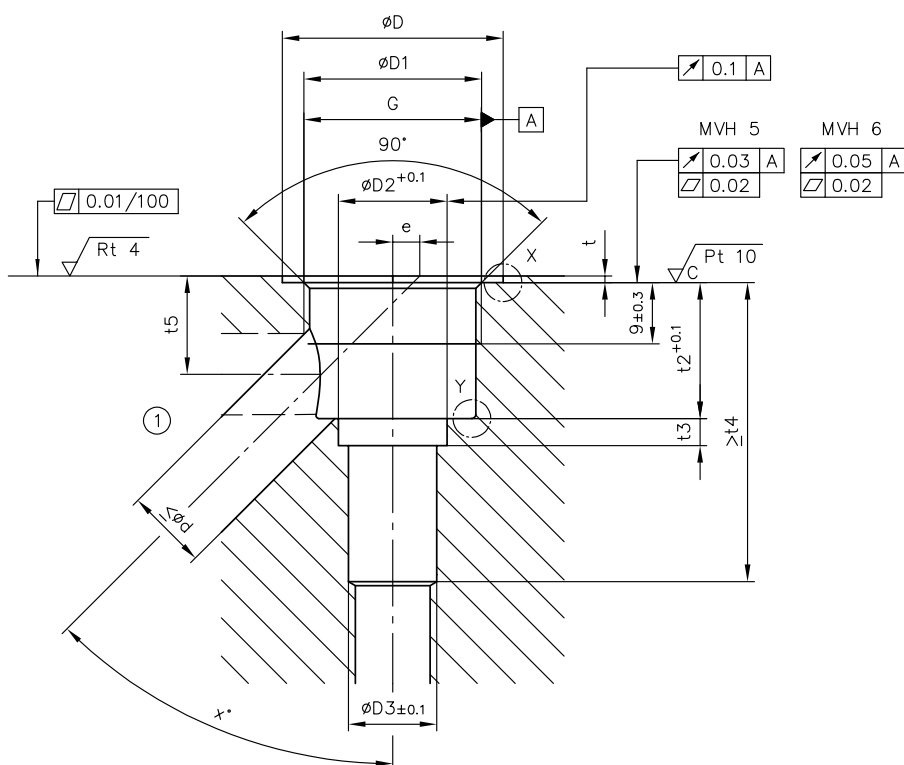


Detail view of X for MVH 4

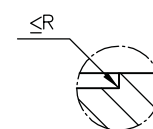


1 Hole $\varnothing d$ optionally x° or 90°

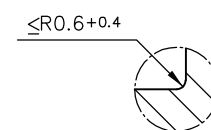
MVH 5, MVH 6



Detail view of X for MVH 5, MVH 6

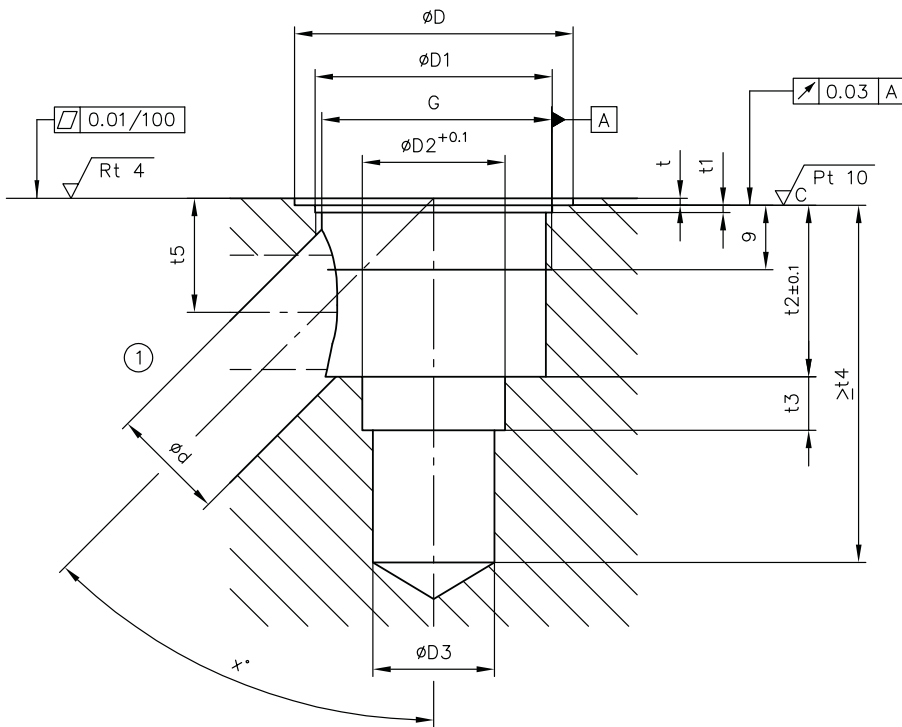


Detail view of Y for MVH 5, MVH 6



1 Hole $\varnothing d$ optionally x° or 90°

MVH 8

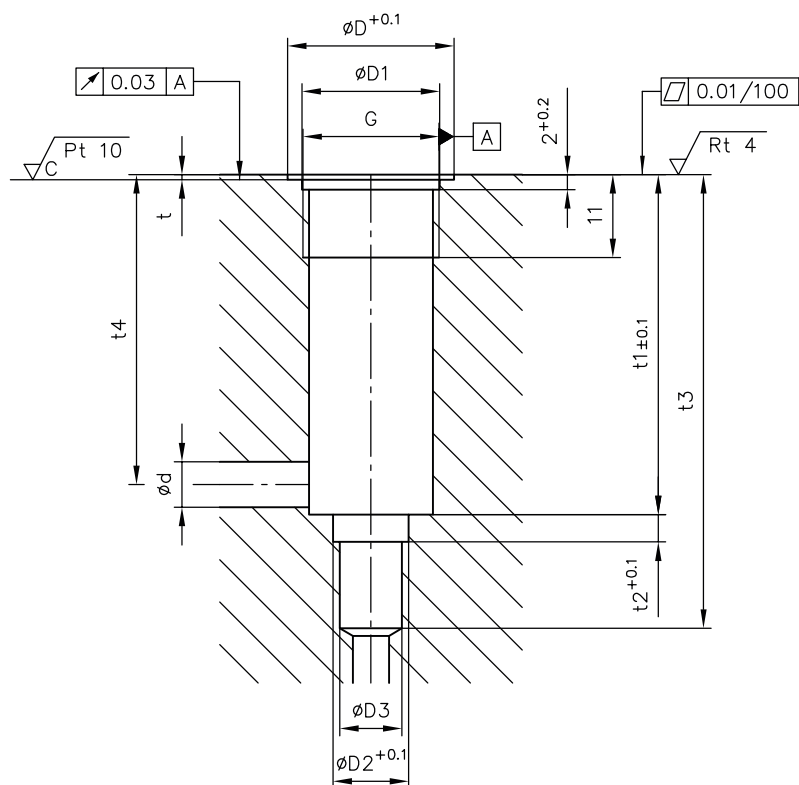


1 Hole $\varnothing d$ optionally x° or 90°

Size	$\varnothing D$	$\varnothing D1$	$\varnothing D2$	$\varnothing D3$	$\varnothing d$	t	t1	t2	t3	t4	t5
4	22+0.1	18.2+0.2	10	8.2	6	0.7+0.2	1+0.3	14.8	3.65+0.05	30	12
5	27.4+0.1	22+0.3	12	10.4	9	1+0.1	--	17	3.5+0.1	37	13
6	32.5+0.2	26.2+0.2	16	13	12	1+0.1	--	20	4+0.1	44	14.5
8	39+0.1	33.2+0.2	20	17	16	1	1+0.2	24	7.5+0.1	50	16

Size	G	e	x°	R
4	M18x1.5	4	45°	--
5	M22x1.5	--	40°	R0.2
6	M26x1.5	4	45°	R0.4
8	M33x1.5	--	45°	--

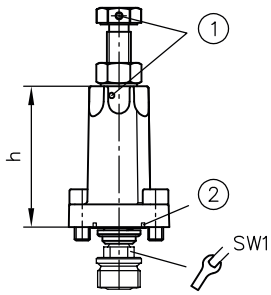
MVZ



Size	$\varnothing D$	$\varnothing D1$	$\varnothing D2$	$\varnothing D3$	$\varnothing d$	t	$t1$	$t2$	$t3$	$t4$	G
4	22	18.2	10	8.2	6	0.7	45	3.6	60	41	M18x1.5
5	27	22.2	12	10.4	9	1	50	3.5	70	45	M22x1.5
6	30	26.2	16	13	12	1	64.5	4	88.5	58	M26x1.5

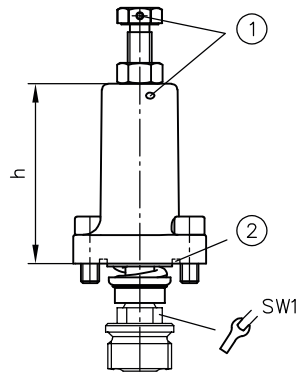
4.2 Valves with screw-in seat

MVD 4, MVD 5

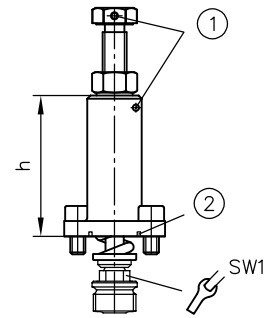


SW = Width across flats

MVD 6

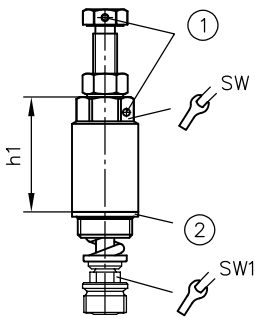


MVA 4, MVA 5, MVA 6



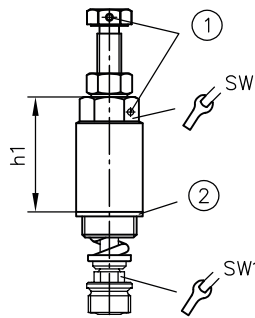
- 1 Sealing option
- 2 O-ring NBR 90 Sh

MVK 4

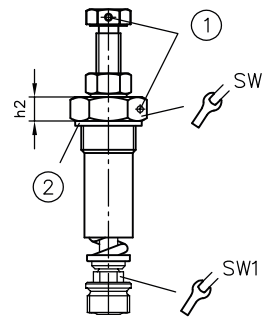


SW = Width across flats

MVK 5, MVK 6



MVU 4, MVU 5, MVU 6



- 1 Sealing option
- 2 Sealing ring DIN 7603-St
O-ring 15.6x1.78 NBR 90 Sh

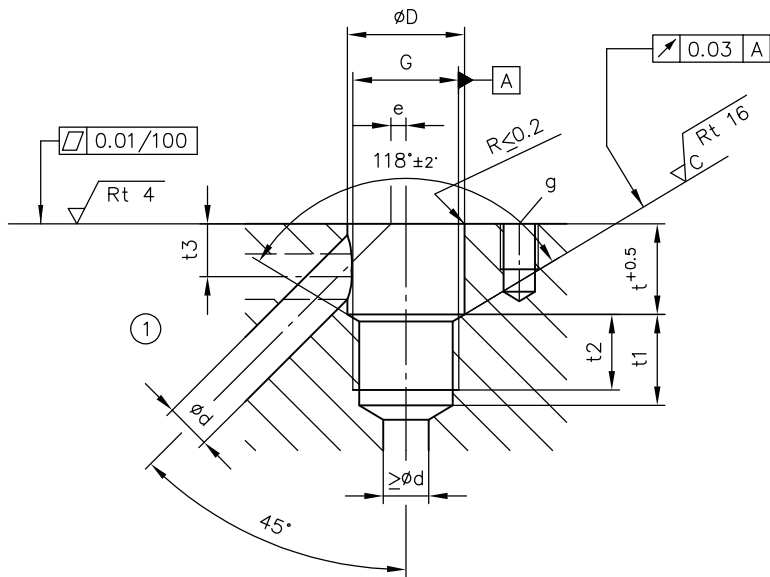
- 1 Sealing option
- 2 Sealing ring
DIN 7603-St (size 6)
DIN 7603-Cu (size 5)

- 1 Sealing option
- 2 Sealing ring
DIN 7603-St (size 4 and 6)
DIN 7603-Cu (size 5)

Size	h	h1	h2	SW	SW1	Tightening torque in steel (Nm)			
						Fastening screws for flange housing		Screw-in spring housing	Screw-in seat housing
						MVD	MVA	MVK, MVU	
4	46.5	38	8	22	10	5 to 5.5	5 to 6	80	35
5	49	42.5	10.5	27	13	5 to 5.5	5.5 to 6	100	70
6	59.5	52	8.5	30	13	9 to 9.5	9.5 to 10	160	90

Mounting hole

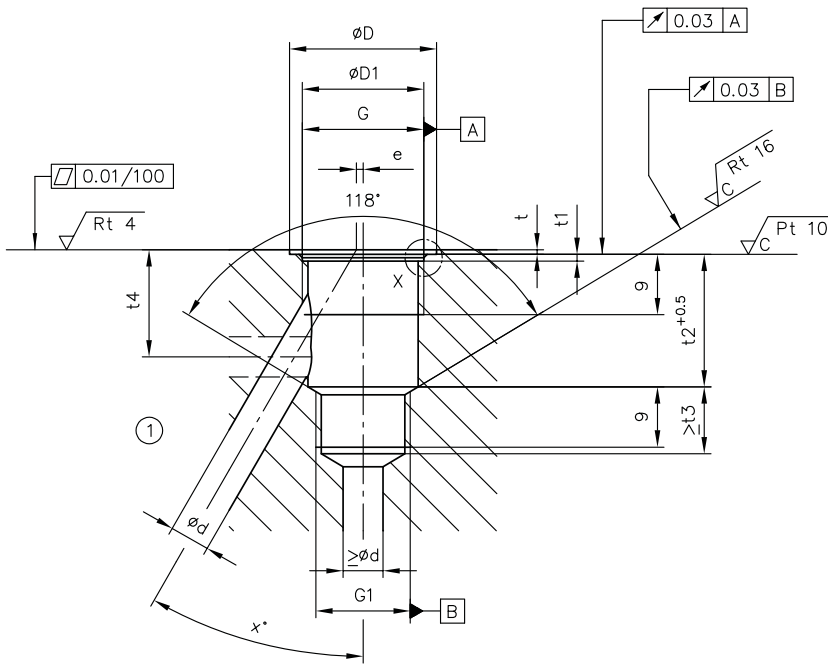
MVD, MVA



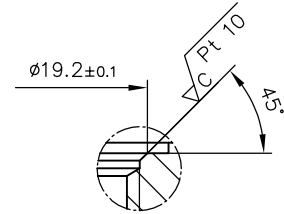
1 Hole $\varnothing d$ optionally 45° or 90°

Size	$\varnothing D$	$\varnothing d$	t	t1	t2	t3	g	G	e
4	15.5	6	12	>12	10	7	M5, 6 deep	M14x1.5	2
5	19	9	14.5	15	9	8	M5, 7 deep	M16x1.5	2.5
6	22	12	19.5	19	9	12	M6, 7 deep	M20x1.5	1

MVK 4

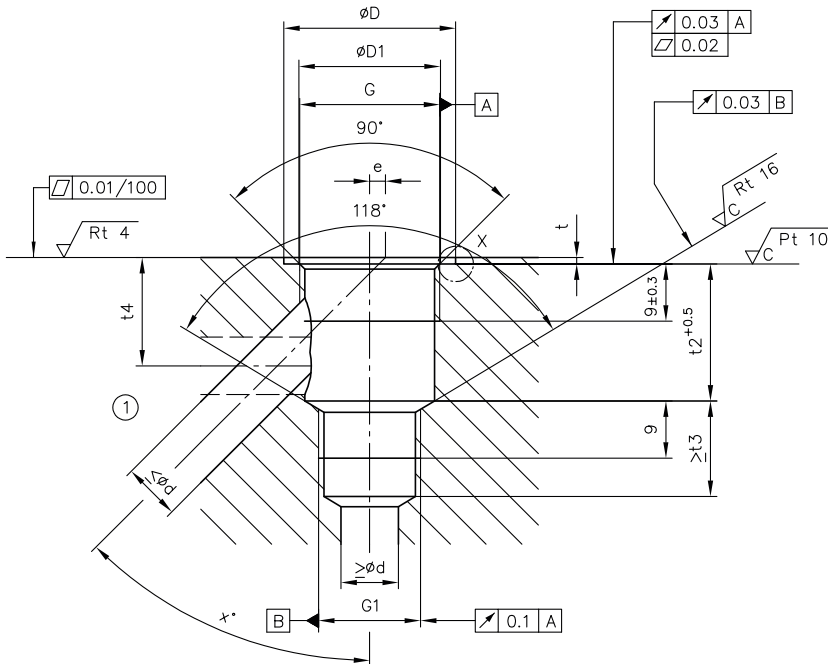


Detail view of X for MVK 4

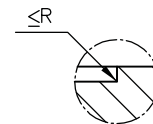


1 Hole $\varnothing d$ optionally x° or 90°

MVK 5, MVK 6



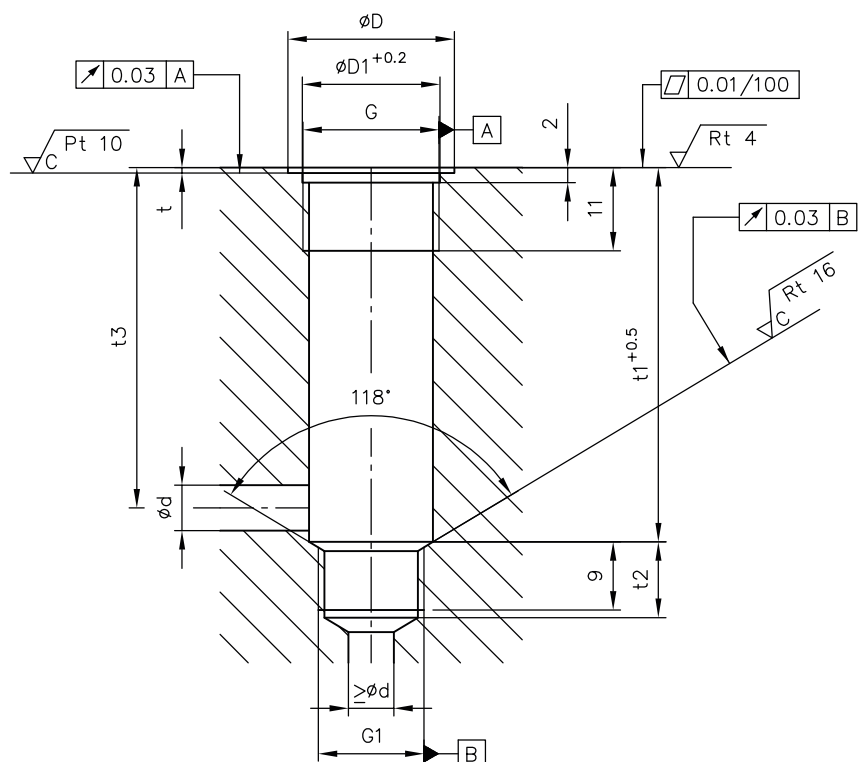
Detail view of X for MVK 5, MVK 6



1 Hole $\varnothing d$ optionally x° or 90°

Size	$\varnothing D$	$\varnothing D1$	$\varnothing d$	t	t1	t2	t3	t4	G	G1	e	x°	R
4	22+0.1	18.2+0.2	6	0.7+0.2	1+0.3	19.8	10	16	M18x1.5	M14x1.5	1	30°	--
5	27.4+0.1	22+0.3	9	1+0.1	--	21.5	15	17	M22x1.5	M16x1.5	2.5	45°	R0.2
6	32.5+0.2	26.2+0.2	12	1+0.1	--	24.5	19	18	M26x1.5	M20x1.5	1	40°	R0.4

MVU



Size	$\varnothing D$	$\varnothing D1$	$\varnothing d$	t	t1	t2	t3	G	G1
4	22 ^{+0.1}	18.2	6	0.7 ^{+0.2}	49.5	10	45	M18x1.5	M14x1.5
5	27 ^{+0.2}	22.2	9	1	54.5	15	49	M22x1.5	M16x1.5
6	30 ^{+0.2}	26.2	12	1	69	19	62	M26x1.5	M20x1.5

Observe the document B 5488 "General operating instructions for assembly, commissioning, and maintenance."

5.1 Intended use

This product is intended exclusively for hydraulic applications (fluid technology).

The user must observe the safety measures and warnings in this document.

Essential requirements for the product to function correctly and safely:

- ▶ All information in this documentation must be observed. This applies in particular to all safety measures and warnings.
- ▶ The product must only be assembled and put into operation by specialist personnel.
- ▶ The product must only be operated within the specified technical parameters described in detail in this document.
- ▶ All components must be suitable for the operating conditions when using an assembly.
- ▶ The operating instructions for the components, assemblies and the specific complete system must also always be observed.

If the product can no longer be operated safely:

1. Remove the product from operation and mark it accordingly.
 - ✓ It is then not permitted to continue using or operating the product.

5.2 Assembly information

The product must only be installed in the complete system with standard and compliant connection components (screw fittings, hoses, pipes, fixtures etc.).

The product must be shut down correctly prior to disassembly (in particular in combination with hydraulic accumulators).



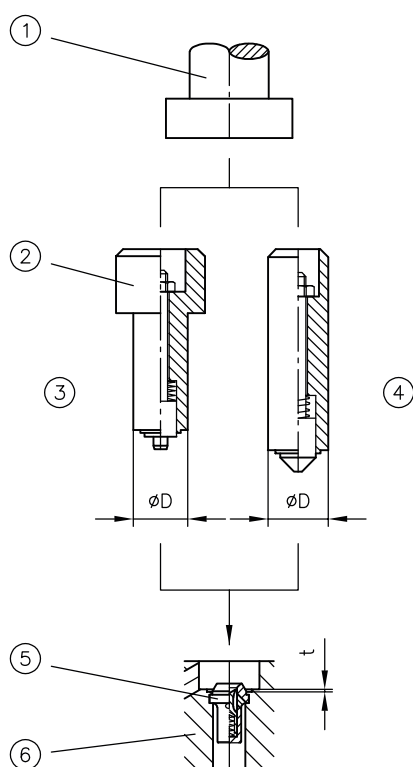
DANGER

Sudden movement of the hydraulic drives when disassembled incorrectly

Risk of serious injury or death

- ▶ Depressurise the hydraulic system.
- ▶ Perform safety measures in preparation for maintenance.

5.2.1 Assembly and peening specifications



- 1 Pressing device
- 2 Peening tool (see table for HAWE tool)
- 3 Size 4, 5 and 6
- 4 Size 8
- 5 Valve seat
- 6 Material: steel, drawn or forged

See the installation information for the shape and dimensions of the mounting hole for the valve seat

HAWE tool

Size	MVF, MVB	MVH	MVJ	MVZ
4	W1-309/20	W1-309/1	--	W1-309/10
5	W1-310/3	D00071294	--	on request
6	W1-311/2	D00141264	on request	on request
8	on request	W1-304/1	--	--

Suitable for valve	ØD	Peening depth t (mm)	Peening force approx. (N) *
MVF 4, MVB 4, MVH 4	15.25 -0.05	0.7 +0.05	50,000
MVZ 4	16.3 -0.1		
MVF 5, MVB 5, MVH 5	18.8 -0.1	0.7 +0.05	65,000
MVZ 5	20.3 -0.1		
MVF 6, MVB 6, MVH 6, MVJ 6	21.9 -0.1	0.8 +0.1	100,000
MVZ 6	24.3 -0.1		
MVB 8, MVH 8	28.9 -0.1	0.7 +0.05	90,000

* It is advisable to increase the punching force gradually and take a measurement afterwards each time until the peening depth **t** is achieved.

NOTICE

Since the peening process can cause tension, it may be necessary to regrind the valve seat with a 70° grinding stone after the peening process.

5.3 Operating instructions

Observe product configuration and pressure/flow rate.

The statements and technical parameters in this document must be strictly observed.
The instructions for the complete technical system must also always be followed.

! NOTICE

- ▶ Read the documentation carefully before usage.
- ▶ The documentation must be accessible to the operating and maintenance staff at all times.
- ▶ Keep documentation up to date after every addition or update.

⚠ CAUTION

Overloading components due to incorrect pressure settings.

Risk of minor injury. Parts may burst or fly off, and uncontrolled leakage of hydraulic fluid.

- Pay attention to the maximum operating pressure of the pump, valves and fittings.
- Always monitor the pressure gauge when setting and changing the pressure.

Purity and filtering of the hydraulic fluid

Fine contamination can significantly impair the function of the product. Contamination can cause irreparable damage.

Examples of fine contamination include:

- Swarf
- Rubber particles from hoses and seals
- Dirt due to assembly and maintenance
- Mechanical debris
- Chemical ageing of the hydraulic fluid

! NOTICE

New hydraulic fluid from the manufacturer may not have the required purity.

Damage to the product is possible.

- ▶ Filter new hydraulic fluid to a high quality when filling.
- ▶ Do not mix hydraulic fluids. Always use hydraulic fluid that is from the same manufacturer, of the same type, and with the same viscosity properties.

For smooth operation, pay attention to the cleanliness level of the hydraulic fluid (cleanliness level see Chapter 3, "Parameters").

Additionally applicable document: [D 5488/1](#) oil recommendations

5.4 Maintenance information

Check regularly (at least once a year) by visual inspection whether the hydraulic connections are damaged. If external leakages are found, shut down and repair the system.

Clean the surface of the device regularly (at least once a year) (dust deposits and dirt).

6 Other information

6.1 Setting instructions

! NOTICE

- ▶ Only perform a pressure adjustment that is potentially required at the installation location when monitoring the pressure gauge and with the pump running.
- ▶ The pressure adjustment may only be carried out if there is no pressure on the return side (R).

Reduction of the setting

Pressure gauge on the pressure line (pressure channel).

1. Type MV.: release lock nut (possibly remove lead seal).
2. Turn adjustment device in anti-clockwise direction and observe pressure gauge while doing so.
3. Limit the maximum adjustable pressure by inserting washers (item 11) if necessary.
4. After making the setting: Tighten lock nut or grub screw.
Type MV.: Potentially reseal valves against authorised adjustment.

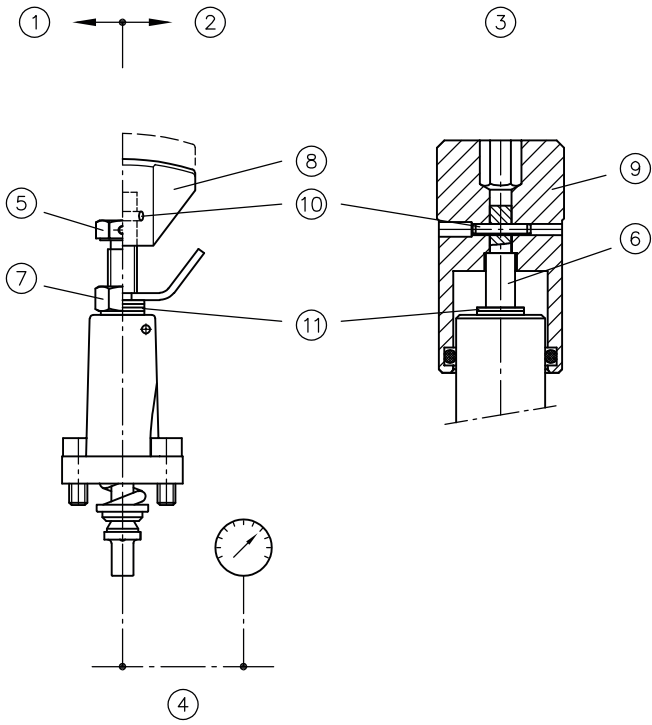
Increase of the setting

1. Observe pressure p_{max} , see Chapter 2.2, "Pressure range and flow rate"
2. Procedure as above.

Adjustment is carried out clockwise. If the adjustable version of the washers prevent the higher setting (turning knob sitting on the lock nut), as many washers can be removed after the roll pin and the wing lock nut are disassembled as are required to achieve the new, higher pressure (measure before and after adjustment). Counter and reattach turning knob with roll pin.

i INFORMATION

The pressure value read from the pressure gauge which occurs when setting or adjusting with the pump running relates to the flow rate on the pump side. Due to a flow rate dependency, there may be slightly altered response pressures in the event of different pump delivery flows (extreme case, hand pump $Q \approx 0$ lpm). If necessary, supplement pressure specification with plain text "at start of response" (start of dripping).



- 1 **fixed**
- 2 **manually adjustable**
Adjustment device coding R
- 3 **manually adjustable**
Adjustment device coding V
- 4 Pressure line
- 5 Threaded screw
- 6 Grub screw
- 7 Lock nut
- 8 Adjusting screw
- 9 Turning knob
- 10 Roll pin
- 11 Washer

References

Additional versions

- Pressure limiting valve type MV, SV and DMV: D 7000/1
- Multiple pressure-limiting valve type MV: D 7000 M
- Pressure-limiting valve, with unit approval type MV .X: D 7000 TUV
- Pressure-limiting valve and pre-load valve type MVG, MVE, and MVP: D 3726
- Pressure valve type CMV, CMVZ, CSV and CSVZ: D 7710 MV
- Pressure-limiting valve, with unit approval type CMVX: D 7710 TUV

